

Notice of Allowability

Application No.

10/723,411

Examiner

Seyed Azarian

Applicant(s)

MALLYA ET AL.

Art Unit

2624

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 6/6/2007.
2. ☒ The allowed claim(s) is/are 6,8-10,12-14,16-18,25-26,29-35,37-40 and 42-45 now renumbered as 1-27.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some* c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date 6/14/2007
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____.
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

Response to Amendment

1. Based on applicant's amendment, filed 6/6/2007, see page 10 through 13 of the remarks, also telephone interview on August 7, 2007, with respect to cancellation of claims 1-5, 7, 11, 15, 19-24, 27-28, 36, 41 and 46, and amended claims 6, 10, 12-14, 18, 25, 29-30, 34-35-40 and 42, have been fully considered and are persuasive, upon further consideration the rejection of 102(e) and 103(a) also 35 usc101 rejection, for claims 6, 8-10, 12-14, 16-18, 25-26, 29-35, 37-40 and 42-45, are hereby withdrawn.

The claims 6, 8-10, 12-14, 16-18, 25-26, 29-35, 37-40 and 42-45, now renumbered as 1-27 are allowed.

EXAMINER'S AMENDMENT

2. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Applicants Attorney (Jason Klindtworth, Reg No. 47,211), on August 7, 2007, without traverse.

The new amended claim 6, 10, 14 and 18 as follows:

Cancel claims 7, 11 and 15

Claim 6. (Currently Amended) A method for segmenting a Structure, comprising the steps of:

iteratively merging one or more candidate voxels into a foreground region comprising at least one or more seed voxels, wherein the candidate voxels are merged

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based on one or more dynamic constraints and wherein the merged candidate voxels become the seed voxels for the next iteration;

iteratively updating a queue of candidate voxels each iteration based upon the new seed voxels; and

terminating the iterative processes to generate a segmented structure comprising the foreground region;

wherein at least one of the dynamic constraints is updated based on at least one of a cross section of the region and a local statistic of the region.

Claim 10. (Currently Amended) A computerized method for segmenting a structure, comprising the steps of:

iteratively merging one or more candidate voxels into a foreground region comprising at least one or more seed voxels, wherein the candidate voxels are merged based on one or more dynamic constraints and wherein the merged candidate voxels become the seed voxels for the next iteration;

iteratively updating a queue of candidate voxels each iteration based upon the new seed voxels; and

terminating the iterative process to generate a segmented structure comprising the foreground region;

wherein the step for iteratively merging updates at least one of the dynamic constraints based on at least one of a cross section of the region and a local statistic of the region.

Claim 14. (Currently Amended) An imaging system, comprising:

an imager configured to generate a plurality of signals representative of one or

more structures within a volume of interest;

data acquisition circuitry configured to acquire the plurality of signals;

data processing circuitry configured to process the plurality of signals, wherein the

data processing circuitry is further configured to iteratively merge one or more candidate voxels into a foreground region comprising at least one or more seed voxels, wherein the candidate voxels are merged based on one or more dynamic constraints and wherein the merged candidate voxels become the seed voxels for the next iteration, to iteratively update a queue of candidate voxels each iteration based upon the new seed voxels, and to terminate the iterative process to generate a segmented structure comprising the foreground region;

system control circuitry configured to operate at least one of the imager and the data acquisition circuitry; and

an operator workstation configured to communicate with the system control circuitry and to receive the plurality of signals from the data processing circuitry;

wherein the data processing circuitry updates at least one of the dynamic constraints based on at least one of a cross section of the region and a local statistic of the region.

Claim 18. (Currently Amended) An imaging system, comprising:

means for iteratively merging one or more candidate voxels into a foreground region comprising at least one or more seed voxels, wherein the candidate voxels are merged based on one or more dynamic constraints and wherein the merged candidate voxels become the seed voxels for the next iteration;

means for iteratively updating a queue of candidate voxels each iteration based

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upon the new seed voxels; and

means for terminating the iterative processes to generate a segmented structure comprising the foreground region;

wherein the data processing circuitry updates at least one of the dynamic constraints based on at least one of a cross section of the region and a local statistic of the region.

REASONS FOR ALLOWANCE

3. The following is an examiner's statement of reasons for allowance.

This invention relates generally, to the field of medical imaging.

Specifically, the invention relates to a technique for automatically extracting structures, particularly three-dimensional structures, from a volume dataset.

Based on applicant's amendment, claim 6 representing claims 10, 14 and 18, the closest prior art of record (Dunn and Celler) references teaches, performing a stratigraphically-based seed detection in a 3-D seismic data volume, but do not teach or suggest, among other things, "candidate voxels are merged based on one or more dynamic constraints and wherein the merged candidate voxels become the seed voxels for the next iteration, iteratively updating a queue of candidate voxels each iteration based upon the new seed voxels, and terminating the iterative process to generate a segmented structure comprising the foreground region; wherein the step for iteratively merging updates at least one of the dynamic constraints based on at least one of a cross section of the region and a local statistic of the region.

The reason for allowance of claims 25, 34 and 40, based on allowable subject matter set forth in the previous office action dated on 4/6/2007 are not repeated herein, but are incorporated by reference. As applicants properly point out in the previous remark, the prior art (Dunn and Celler) references fail to disclose the claimed limitations.

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These key features in combination with the other features of the claimed invention are neither taught nor suggested by (Dunn and Celler) prior art of record.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Contact Information

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Seyed Azarian whose telephone number is (571) 272-7443. The examiner can normally be reached on Monday through Thursday from 6:00 a.m. to 7:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Bella, can be reached at (571) 272-7778. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application information Retrieval (PAIR) system. Status information for published application may be obtained from either Private PAIR or Public PAIR.

Status information about the PAIR system, see [http:// pair-direct.uspto.gov](http://pair-direct.uspto.gov). Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Seyed Azarian
Patent Examiner
Group Art Unit 2624
August 12, 2007

Seyed azarian